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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/017,033	12/14/2001	Hichem M'Saad	A6139/T43800	7470

32588 7590 04/19/2005

APPLIED MATERIALS, INC.
2881 SCOTT BLVD. M/S 2061
SANTA CLARA, CA 95050

EXAMINER

HOFFMANN, JOHN M

ART UNIT PAPER NUMBER

1731

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/017,033	M'SAAD, HICHEM	
	Examiner	Art Unit	
	John Hoffmann	1731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3-18 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-18 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 3 – 7, 13-15, 18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bazylenko 6154582, in view of Dragone 5136671, Shieh 6204200 and optionally in view of Zhong and Van Cleemput 5872058 or Roche 5913140,

The basic method is disclosed in Bazylenko at the paragraph spanning cols. 6-7, figure 1A and col. 2, line 56. However, the plurality of cores, the aspect ratio, the gap width and the deposition-sputter ratio is not taught. It is noted that it would have been obvious to put multiple cores on the substrate so as to have more pathways for light communication. Duplication of parts is rarely a patentable invention and Applicant has

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not indicated any evidence of non-obviousness. Furthermore multiple cores is conventional: see Dragone.

Moreover, Dragone discloses (col. 1, lines 42- 52) that the waveguides must be closely spaced, but that such causes crosstalk. It would have been obvious to perform routine experimentation to determine the optimal spacing between the waveguides to balance these two conflicting effects. As can be seen in Dragone, the cores are shown to get closer and closer – until they meet – it would be reasonable to expect that at some location before they meet, that the gap is 1-2 microns wide.

As an alternative combination: it would have been obvious to make the Dragone device by using the Bazylenko method for the advantages that Bazylenko discloses for example in col. 3.

Shieh is cited because it shows that it is known that the claimed deposition-sputter ratio is a result effective variable when using HDP silica deposition and discloses a values that are consistent with applicant: see claim 8 of Shieh as well as col. 3, lines 1-57 and figure 6.

Van Cleemput and Roche are optionally cited as showing that applicant's gap-fill problem and solutions are well known.

On the basis of what is known to those in the high density plasma deposition art: it would have been obvious to have the claimed deposition-sputter ratio so as to be able to fill any gap between adjacent cores. Alternatively, it would have been obvious to perform routine experimentation to determine the optimal deposition-sputter ratio.

As to the aspect ratio: it is clear that if one were to use the Bazylenko 4.5 micron cores with a 1-2 micron gap, that one would have an aspect ratio of 2.25:1 – 4.5:1. Van Cleemput, Zhong and Roche show that such aspect ratios are known to be filled with HDP.

As to the newly added limitations: see col. 2, lines 34-35, and col. 6, lines 63-67 of Bazylenko for the flowing step. As to the inductively generate plasma: see col. 6, line 19 of Bazylenko. Examiner gives Official notice that ECR creates plasma by induction. As to the ion density, if such is not inherently met, it would have been obvious to perform routine experimentation to determine the optimal process parameters.

Claim 3: col. 6, lines 22-25 of Bazylenko.

Claim 18: see col. 6, line 19 of Bazylenko.

Claim 4: The flow rates are not disclosed. It would have been obvious to have whatever flow rates in as desired – depending upon the scale of the operation/chamber. Clearly a small substrate would require a lower flow rate than a large substrate. Furthermore, it would have been obvious to perform routine experimentation to determine the optimal flow rates.

Claim 5: see col. 7, line 4 of Bazylenko.

Claim 6, Examiner gives Official notice that it is conventional to use inert gas in HDP process for any number of reasons: to flush, to act as a carrier gas, etc. It would have been obvious to use an inert gas for any of the well known reasons, with no new or unexpected results.

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Claim 7: see col. 2, lines 34-35, and col. 6, lines 63-67 of Bazylenko : any amount would be obvious based on the scale of the operation, and the degree of doping desired.

Claim 13: based on col. 5, line 49 and col. 6, line 12 of Bazylenko, the power density appears to be only 4 W/cm². It would have been obvious to perform routine experimentation to determine the optimal power, with no new or unexpected results. Furthermore, even if one was felt that they were limited to the disclosed power for the figure 1a of Bazylenko embodiment, such gives no indication as to what the power would be for the ECR (col. 6, line 19) alternative embodiment. It would have been obvious to perform routine experimentation to determine the optimal power for the ECR embodiment.

Claim 14: there is a bias applied: col. 6, lines 13-14. It would have been obvious to perform routine experimentation to determine the optimal bias power.

Claim 15: Bazylenko uses a pressure of 15 millitorr. It would have been obvious to perform routine experimentation to determine the optimal pressure in the ECR apparatus.

Claim 20: col. 6, lines 64-65 of Bazylenko discloses an index of 1.45 which is between 1.46 and 1.4473. 1.46 is "about 1.4443". There is no indication that the 1.45 value is at 1550 nm. If the claim limitations aren't inherently met, it would have been obvious to have what ever index one desires, depending upon the particular optical device/characteristics one desires.

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Claim 8 rejected under 35 U.S.C. 103(a) as being unpatentable over Bazylenko 6154582, in view of Dragone 5136671, Shieh 6204200 and optionally in view of Zhong and Van Cleemput 5872058 or Roche 5913140 as applied to claim 7 and further in view of Ngai 6451686.

In the HDP deposition art, SiF_4 and CF_4 are known equivalents for fluorine sources see col 13, lines 46-54 and col. 12, lines 33-37 (Ngai). IT would have been obvious to substitute equivalents in the Bazylenko method, depending upon which gases are most available.

Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bazylenko 6154582, in view of Dragone 5136671, Shieh 6204200 and optionally in view of Zhong and Van Cleemput 5872058 or Roche 5913140 as applied to claim 2 above, and further in view of Imoto 4856859.

Bazylenko dose not disclose using phosphorous gas as claimed. Imoto discloses that one can dope cladding using the claimed gas: col. 4, lines 61-66 and col. 2, lines 20-28. It would have been obvious to include the claim gas depending upon what specific glass is desired and what particular properties one desires for the final product. The particular flow rates would have been obvious depending upon the desired degree of doping, and the size of the substrate to be made.

For claim 11 – it would be obvious to include boron as claimed – if one desires the known properties that boron produces in the final product.

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Zhong is cited as being an "optional" because it is not necessary to demonstrate the invention is obvious (in the event that Applicant swears behind the Zhong filing date.) However Zhong does show that it is known to use HPD to make conformal layers with glass that includes boron and phosphorous.

Claims 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bazylenko 6154582, in view of Dragone 5136671, Shieh 6204200 and optionally in view of Zhong and Van Cleemput 5872058 or Roche and Imoto 4856859 as applied to claim 11 above, and further in view of Schneider 4557561.

The boron trifluoride is not taught. Col. 3, lines 29-40 of Schneider discloses using the boron trifluoride when making a glass: to 1) add fluoride, and 2) to add the boron as a dopant. It would have been obvious to use boron Trifluoride in the Bazylenko process so as to supply another dopant Boron, and to help incorporate fluorine into the glass – depending upon the desired optical/chemical properties the artisan wishes to have in the final product.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bazylenko 6154582, in view of Dragone 5136671, Shieh 6204200 and optionally in view of Zhong and Van Cleemput 5872058 or Roche 5913140 as applied to claim 1 above, and further in view of Rossman 6194038

Bazylenko discloses different operating parameters than is being claimed.

However, Rossman recognizes that the same claimed operating parameters “greatly increases the deposition rate” (col. 2, lines 29-34) – among other advantages. See col. 3, lines 8-37 of Rossman which discloses the various parameters. Col. 2 lines 9-21 discloses that the process is of the same nature as applicants’ and Bazylenko’s. It would have been obvious to change the Bazlenko parameters/gases to be in line with the Rossman parameters/gases for any or all of the Rossman advantages.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bazylenko 6154582, in view of Dragone 5136671, Shieh 6204200 and optionally in view of Zhong and Van Cleemput 5872058 or Roche 5913140 as applied to claim 1 above, and further in view of Rossman 6194038 and Narita 6122934

For claim 17: Narita discloses the same problem that Applicant and Rossman notes: a gap between two close structures. Bazylenko does not disclose this problem. It would have been obvious to have as many cores/waveguides on the substrate as possible, so as to have a high a circuit density as possible. It would have been obvious to use the Rossman method of etching between gaps so as to create conformal layers, and for the high deposition rate. It would have been further obvious to add an additional layer so as to protect the optical device as disclosed in the Narita Abstract.

Zhong is cited as being an “optional” because it is not necessary to demonstrate the invention is obvious (in the event that Applicant swears behind the Zhong filing

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date.) However Zhong does show that it is known to use HPD to make conformal layers with glass that includes boron and phosphorous.

Response to Arguments

Applicant's arguments filed 15 March 2005 have been fully considered but they are not persuasive.

It is argued that Bazylenko does not disclose multiple pathways. This is not very relevant because 1) various secondary references disclose that it is known 2) it is prima facie obvious to duplicate parts for duplicate effects. It is not invention to have multiple waveguides. Whereas applicant also alleges improper hindsight there is no explanation as to why to support such a conclusion.

It is further argued that Bazylenko discloses only PECVD process. This is incorrect see the rejection which points to Bazylenko's disclosure of the ECR process.

As to the plasma density not be generated with Bazylenko's capacitively generated plasma. The present rejection relies on Bazylenko's ECR. See rejection.

It is further argued that there is no reasonable expectation of success. The secondary references provide the reasonable expectation of success. As stated previously, "Van Cleemput and Roche are optionally cited as showing that applicant's gap-fill problem and solutions are well known." Applicant's unsupported assertion that one of ordinary skill could not fill gaps is not well taken; the evidence of record clearly shows that one of ordinary skill knows how to fill gaps of the claimed aspect ratio.

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Although applicant does not agree that one would not reasonably expect a gap of 1-2 microns, applicant has not addressed the prior statement indicating it would have been obvious to perform routine experimentation to determine the optimal spacing.

Furthermore, size is usually not a patentable invention:

From MPEP 2144.04

A. Changes in Size/Proportion

In re Rose , 220 F.2d 459, 105 USPQ 237 (CCPA 1955) (Claims directed to a lumber package "of appreciable size and weight requiring handling by a lift truck" where held unpatentable over prior art lumber packages which could be lifted by hand because limitations relating to the size of the package were not sufficient to patentably distinguish over the prior art.); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976) ("mere scaling up of a prior art process capable of being scaled up, if such were the case, would not establish patentability in a claim to an old process so scaled." 531 F.2d at 1053, 189 USPQ at 148.).

In Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

As clear from the secondary references, the solution to applicant's problem was known at the time of invention. So it does not seem likely that the present size limitations are patentably significant.

It is argued that the secondary references were directed to "an entirely different physical realm". The relevance of this is not understood. Examiner is not aware of any case law or Office policy which prohibits different realms, nor what constitutes a "realm." It has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the

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claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, the secondary references are reasonably pertinent to applicant's gap-fill problem.

The arguments regarding criticality are not understood. It appears that such is merely an assertion without any evidence to support it.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

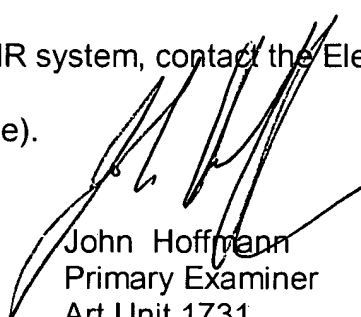
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Hoffmann whose telephone number is (571) 272 1191. The examiner can normally be reached on Monday through Friday, 7:00- 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



John Hoffmann
Primary Examiner
Art Unit 1731

4-17-05

jmh